# Recycled Construction Materials


## Summary

The safest, easiest and least expensive ways to reduce material production and disposal impacts are to produce less, use less, re-use more and recycle everything possible. Of the millions of tons of garbage that Americans produce each year it is estimated that more than 70% of it could be recycled.


## Reducing, Re-Using and Recycling

- Conserves natural resources by reducing the demand for raw materials,
- Conserves energy and water since manufacturing with recycled materials requires less processing than extracting raw materials,
- Reduces air and water pollution since manufacturing from recycled materials is generally a cleaner process and uses less energy,
- Minimizes what is discarded, which maximizes limited landfill capacities and
- Protects our health and the environment when harmful substances, which can be recycled, are removed from the waste stream and processed back into useable products.

## Recycling Facts

- Recycling cuts energy consumption and pollution. Paper recycling can reduce air pollutants by 75% percent and water pollution by 67 percent; using scrap steel and iron rather than virgin products results in an 86 percent reduction in air pollution and a 76 percent reduction in water pollution; recycling aluminum saves 95 percent of the energy used to produce it from virgin products.
- A ton of recycled paper saves 17 trees and three cubic yards of landfill space.
- Buying recycled products is an essential part of making recycling work (closing the loop). The residential building industry can play a major role in helping to reduce waste and promote recycling by specifying and asking for recycled products.

## Recycling Symbols

Buying recycled-content building products helps to ensure that materials collected in recycling programs will be used again in the manufacture of new products.

The most recognized recycling symbol is a triangle formed by three arrows chasing each other. It was created in 1970 for the first Earth Day as part of a contest sponsored by the Container Corporation of America. This symbol has become standardized for different types of materials and there are slight variations depending on the type of material. Below are examples and explanations of some of these industry variations.

## Plastics

The symbol variation for plastic products has three thin arrows and a number in the middle. The number indicates the type of plastic used to make the product. This identification is important because plastics may not be mixed during recycling. Even a small amount of a different type can make the entire batch unusable. Types 1 and 2 make up 90 percent of the plastic bottle market generally available to consumers.

**Type 1 – PETE or PET (Polyethylene Terephthalate)** Used for soda, liquor and juice bottles and peanut butter jars and some jars for oils. This plastic can be recycled into new construction products including fabrics and carpet fibers.

**Type 2 – HDPE (High-Density Polyethylene)** Used for milk, juice, detergent, bleach and motor oil containers. When recycled, this plastic is used for lumber substitutes, trash and compost containers among other products.

**Type 3 – V or PVC (Vinyl/Polyvinyl Chloride)** Used for windows, doors, shower curtains, and similar products. This plastic can be recycled into fencing, sewer pipes and garden hoses.

**Type 4 – LDPE (Low-Density Polyethylene)** Used for cellophane wrap, stretch wrap and squeeze bottles. This plastic is recycled to make similar products.

**Type 5 – PP (Polypropylene)** Used for food containers and long underwear. This plastic is recycled into furniture, carpet and auto parts.

**Type 6 – PS (Polystyrene)** Also know as Styrofoam. This plastic is recycled into plastic wood, packing peanuts, office and desk accessories.

**Type 7 – Other Plastics.** This designation is for all other plastics that are difficult to recycle.

## Paper

The American Forest & Paper Association standardized guidelines for using the recycling symbol to specify the content of recycled paper within a product.

- The symbol of three white arrows within a black circle is used only to designate products made solely of recovered paper fiber.
- Less than 100 percent content is designated by three black arrows within a white circle and must state the percentage of content next to or below the symbol.

Most paper can be recycled unless it has been tainted with food or coated with wax.

Building and construction materials that utilize recycled paper products include cellulose for insulation, cellulose fiberboard and gypsum board sheeting material.

## Glass

Generally glass products do not have a symbol. Consumers just need to be aware that bottles cannot be mixed with other types of glass, like mirrors and light bulbs.

Recycled glass used in new construction products includes new window glazing, wall and floor tiles and fiberglass insulation.

## Aluminum and Steel

Products of aluminum or steel usually have a black symbol and the words “Where facilities exist.” Aluminum and steel must be separated or the aluminum recycling plants

can be damaged. Some steel cans have aluminum lids and may still be recycled by the steel industry.

The building and construction materials industry utilizes recycled aluminum in flashing material and window components. Recycled steel is used for framing connectors, nails and structural framing.

## Nebraska Green Building Program

Builders participating in the Nebraska Green Building Program are encouraged to use recycled-content building materials in all aspects of the construction of their homes. Recycled-content product options provide participating builders with "Green Building" credit in each of the following phases of construction:

### Site Development

- ❖ Outdoor structures, decking and landscape material made from recycled-content materials such as plastic lumber or borate-treated engineered lumber

### Foundations

- ❖ Reinforced cementitious structure using fly ash concrete
- ❖ Locally produced coal fly ash concrete with a minimum of 15 percent ash
- ❖ Recycled-content foundation block

### Building Envelope Construction

- ❖ Recycled-content roof material with a minimum of 20 percent recycled content
- ❖ Gypsum board made from recycled paper or recycled cellulose fiber integrated into gypsum
- ❖ Steel studs used in more than 90 percent of the interior walls of structure
- ❖ Reconstituted or recycled-content siding containing a minimum 50 percent pre- or post-consumer waste
- ❖ Reconstituted or recycled-content fascia, soffit or trim with a minimum 50 percent pre- or post-consumer waste
- ❖ Recycled content underlayment and/or sheathing with a minimum 50 percent pre- or post-consumer waste or Oriented strand board
- ❖ Recycled gypsum plaster

### Interior Finishing

- ❖ Reconstituted or recycled-content interior doors (hardboard) with least toxic binders
- ❖ At least 50 percent of the doors are recycled
- ❖ Recycled-content carpet pad
- ❖ Recycled-content carpet that is tacked, not glued
- ❖ Recycled-content ceramic tile
- ❖ Locally produced coal fly ash concrete where the slab foundation doubles as finished floor
- ❖ Recycled content floor tile
- ❖ Recycled trim
- ❖ Least toxic reconstituted recycled-content cabinet materials
- ❖ Recycled content countertops with a minimum of 20 percent recycled content
- ❖ Paints or finishes with recycled-content

*Recycled Construction Materials* is one in a series of factsheets that include:

1. Construction Waste Minimizations Methods
2. Efficient Design and Construction
3. Site Development for Environmental Preservation and Energy Efficiency
4. Low Water Use Benefits
5. Minimizing Use of Lumber Products in Residential Construction

Other factsheets and additional information can also be found at: www.nol.org/home/NEO/home_const/recycled_content.htm

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## Recycled-Content Building Materials Available In Nebraska

The Nebraska Energy Office has identified recycled-content building materials currently available to Nebraska builders. This information can be found at **http://www.nol.org/home/NEO/home_const/recycled_content.htm**

## Recycling Terms

Builders purchasing or specifying recycled-content materials should also have an understanding of some industry-specific terms. The following are some of the most commonly used industry terms and their definitions:

- ❖ **coal fly ash** — *a by-product of burning coal at electricity plants. It is called "fly" ash because it is transported from the combustion chamber by exhaust gases. Fly ash can be used as an ingredient in concrete.*
- ❖ **crumb rubber** — *a fine granular or powdered rubber capable of being used to make a variety of products such as floor tiles and resilient flooring. It is recovered from scrap tires using thermal and/or mechanical processing techniques. Crumb rubber also is derived from the tire retreading process, when worn tire tread is removed during a buffing process before the new tread is affixed.*
- ❖ **GGBF** or **Ground granulated blast furnace slag**. — *a by-product of iron blast furnaces. The slag is ground into granules finer than Portland cement and can be used as an ingredient in concrete.*
- ❖ **Post-consumer material** — *a finished material which would have been discarded, having completed its life-cycle as a consumer item.*
- ❖ **Recovered materials** — *waste materials and by-products that have been recovered or diverted from solid waste, but do not include materials and by-products generated from, and commonly reused within, an original manufacturing process.*
- ❖ **Secondary material** — *fragments of finished products or finished products of a manufacturing process, which have converted a resource into a commodity of real economic value, but do not include excess resources of the manufacturing process.*
- ❖ **Virgin material content** — *the portion of the product made from the non-recycled material or material that is neither secondary nor post-consumer.*

## Resources

City of Austin Green Building Program **http://www.ci.austin.tx.us/greenbuilder/fs_homerecycle.htm**

California Integrated Waste Management Board (CIWMB)

United States Environmental Protection Agency Office of Solid Waste **http://www.epa.gov/cpg/about.htm**

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